



December 29, 2022

The Honorable Chair and Members of the
Hawai'i Public Utilities Commission
465 South King Street
Kekuanaoa Building, 1st Floor
Honolulu, Hawai'i 96813

Dear Commissioners:

Subject: Docket No. 2018-0141 – Grid Modernization Strategy Phase 1
Hawaiian Electric Companies' Semi-Annual Progress Report

In accordance with Ordering Paragraph 4 of Decision and Order No. 36230 filed on March 25, 2019, in the subject proceeding, Hawaiian Electric¹ respectfully submits the semi-annual progress report (covering the second half of 2022) on Phase 1 of its Grid Modernization Strategy implementation.

Certain portions of the report contain confidential information that is being filed under separate cover pursuant to Protective Order No. 35591, filed on July 18, 2018, in this proceeding. Exhibit A to this letter provides the bases for the confidential treatment of the redacted information.

Sincerely,

/s/ Marisa Chun

for Kevin M. Katsura
Director
Regulatory Non-Rate Proceedings

Attachment

cc: Consumer Advocate

¹ Hawaiian Electric Company, Inc., Maui Electric Company, Limited, and Hawai'i Electric Light Company, Inc. are each doing business as "Hawaiian Electric" and have jointly registered "Hawaiian Electric" as a trade name with the State of Hawai'i Department of Commerce and Consumer Affairs, as evidenced by Certificate of Registration No. 4235929, dated December 20, 2019.

PHASE 1 GRID MODERNIZATION SEMI-ANNUAL STATUS REPORT

Pursuant to Decision and Order No. 36230 (“D&O 36230”), filed March 25, 2019, in Docket No. 2018-0141, Ordering Paragraph No. 4, the Hawaiian Electric Companies¹ submit the following semi-annual status and progress report (“Report”) for the Grid Modernization Strategy Phase 1 (“Phase 1”).

I. EXECUTIVE SUMMARY

Despite supply chain-related headwinds, the Companies have cumulatively deployed advanced meters to more than 40% of all customers and remain on-track to complete full Advanced Metering Infrastructure (“AMI”) deployment by Q3 2024. Since the last Report, the Companies have aggressively expanded the Radio Frequency (“RF”) mesh Field Area Network (“FAN”), exponentially deployed advanced meters across the service territory, and upgraded its Meter Data Management System (“MDMS”) to a newer version to maintain vendor lifecycle support.² By the end of 2022, the Companies forecast having close to 200,000 cumulative AMI customers. Other efforts included education and outreach to customers on the My Energy Use tool and benefits available to better manage electricity use. The Companies remain pleased by continued low customer opt-out rates, as well as manageable rates of hazardous customer metering equipment repairs.

Despite the “all hands-on deck” approach for supply chain mitigation described in the last Report, the Companies were affected by meter material shortages and had to adjust its deployment plans. The Companies will expand further in this Report and continues to work closely with its AMI technology partner, Landis+Gyr (“L+G”), to proactively navigate the turbulent supply chain environment.

Outside of deploying advanced meters, the Companies continue to provide Hawaii Energy all data from advanced meters under the same data sharing terms as used for traditional meters, as well as provide public entities with aggregated and anonymized energy usage data. With Commission approval of the Companies’ Data Clearinghouse innovation pilot, the Companies look forward to implementing the Data Analytics Clearinghouse that will make the data sharing process with public entities easier and more productive.

Further, the Companies believe accurate reporting of quantifiable benefits for Grid Mod Phase 1 is not attainable until the 2024 Annual Major Project Interim Recovery

¹ Hawaiian Electric Company, Inc., Hawai‘i Electric Light Company, Inc. and Maui Electric Company, Limited are collectively referred to as the “Hawaiian Electric Companies” or the “Companies.”

² The MDMS upgrade was outside the scope of Grid Mod Phase 1 and the cost was included in the ARA for revenue recovery.

(“MPIR”)/Exception Project Recovery Mechanism (“EPRM”) True-up filing. By this time, the net benefits of AMI will be clearer as the Companies will have deployed AMI to more than 75% of the service territory. In accordance with the MPIR/EPRM Guidelines, to the extent any savings or benefits attained during 2023 can reasonably be quantified, the Companies will offset costs in determining costs recovered through the MPIR/EPRM adjustment mechanism in the 2024 Annual MPIR/EPRM report filed in February 2024. However, in this Report, the Companies will share its initial thoughts on the benefits quantification methodology.

The Companies provide below key Hawaiian Electric service territory wide installed meter, installed telecom and opt-out information for the Commission’s review.

Program to Date (As of December 16, 2022)				
Gateways Installed	Routers Installed	Customer Outreach ³	Customer Opt-Outs ⁴	Meters Installed (RF Mesh/Cellular/PLX)
119	165	422,565	8,368	188,698 (186,303/798/1,597)

Table 1 – Hawaiian Electric Meters and Units of Telecom Installed (Cumulative)⁵

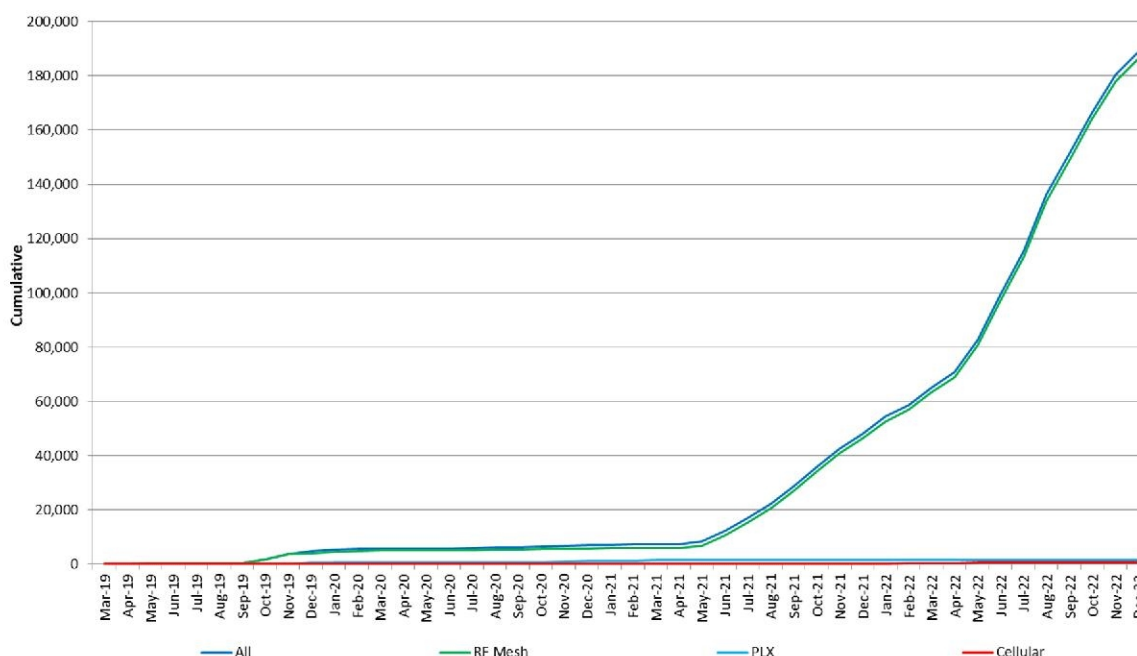


Figure 1 – Hawaiian Electric Meters Installed (Cumulative)⁶

³ Cumulative unique customer accounts who received at least the initial 60+ day letter or email about their upcoming meter exchange since D&O 37655.

⁴ Cumulative Advanced Metering Infrastructure (“AMI”) opt-outs received since the beginning of the Smart Grid Foundation Project.

⁵ As of December 16, 2022.

⁶ As of December 16, 2022.

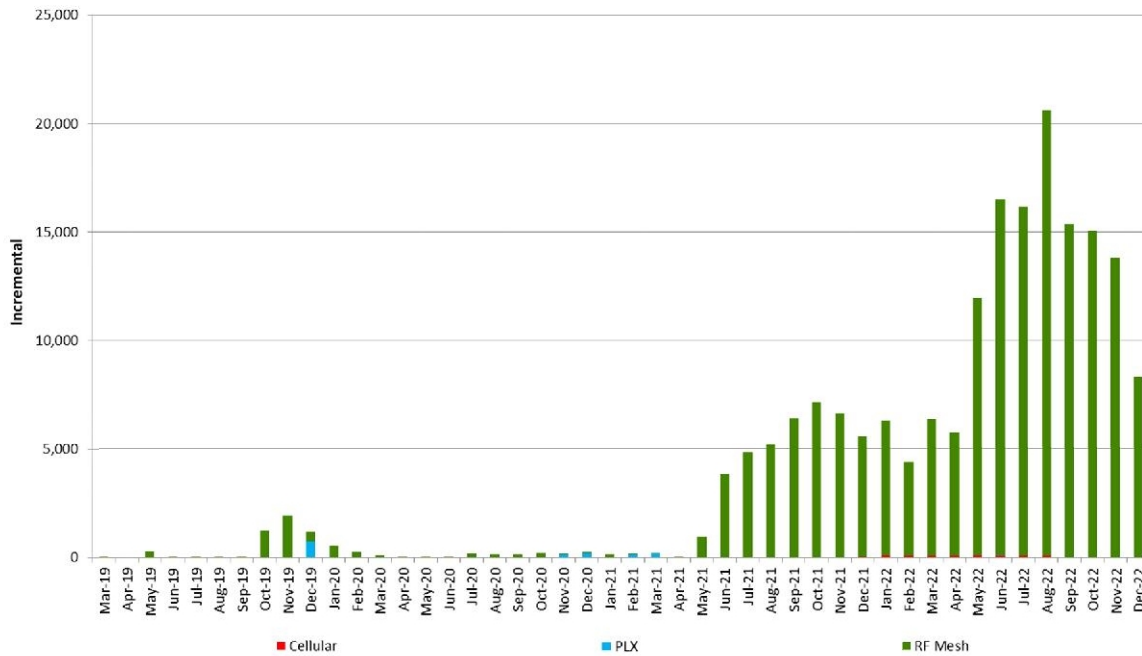


Figure 2 – Hawaiian Electric Meters Installed (Incremental)⁷

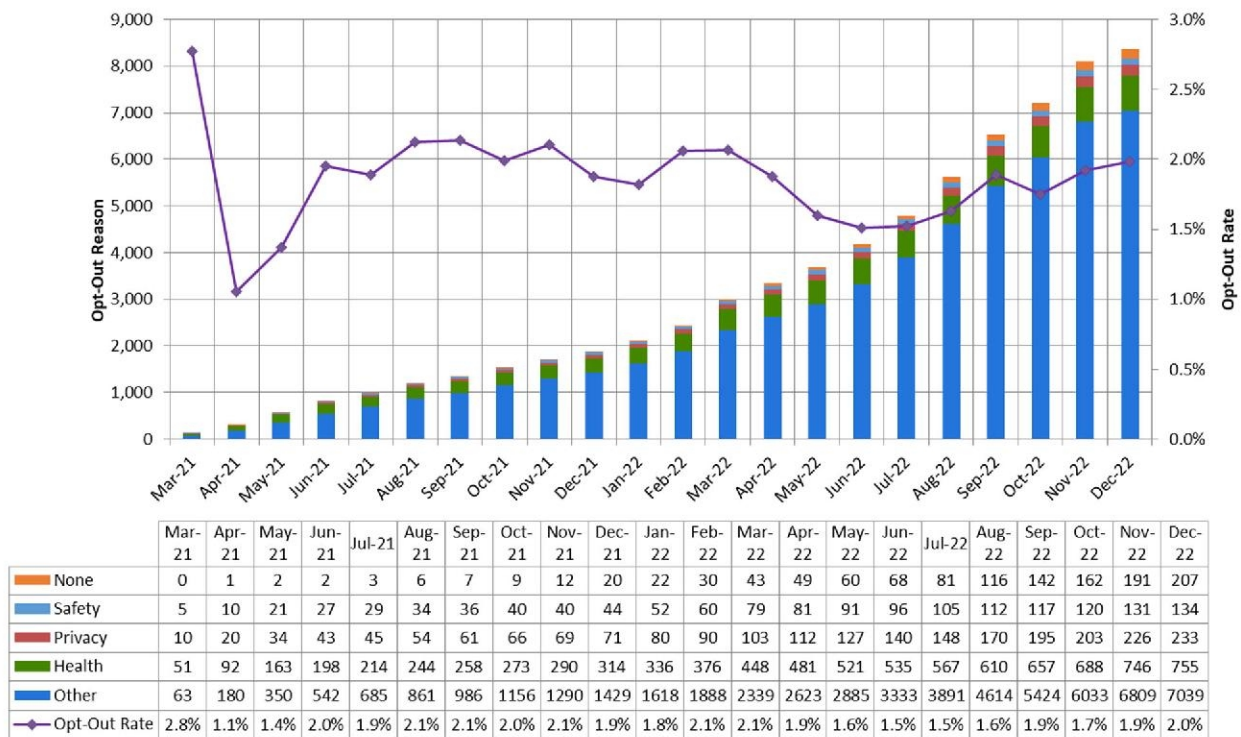


Figure 3 – Hawaiian Electric AMI Opt-Out (Cumulative)⁸⁹

⁷ As of December 16, 2022.

⁸ The AMI opt-out metric represents opt-outs since program inception divided by the number of unique customer accounts who received their 60-day notification since Commission approval of proportional deployment.

⁹ As of December 16, 2022.

Pursuant to D&O 36230, D&O 37655, and D&O 38241 in Docket No. 2018-0141 (“Order 37655”), this Report provides the following:

- The status of meter and infrastructure installations
- Update on deployment plans
- The capital and deferred costs incurred by the Company
- Update on collaborative data sharing efforts with public entities
- Costs associated with repair of customer metering equipment hazards

In addition to the AMI deployment, since the last Semi-Annual Status Report filed on June 30, 2022, the following regulatory activities have occurred:

- The Commission issued D&O 38680 in Docket 2019-0323 establishing an Advanced Rate Design (“ARD”) Implementation framework to inform Hawaiian Electric’s development and implementation of advanced rates.
- The Commission issued D&O 38775 directing the Companies to implement data aggregation standards to enable the City and County of Honolulu’s Better Buildings Benchmarking Program.

II. STATUS AND NEAR-TERM PLANS

A. Meters and Units of Telecom Infrastructure Installed

1. Oahu

The Companies have deployed advanced meters to about 35% of Oahu customers and are on-track to meet the Q3 2024 target of deploying AMI to all 309,000 Oahu customers, less opt-outs. About 1.4% of notified Oahu customers have elected to opt-out so far. A map showing the AMI and non-AMI customers on Oahu is provided further below in Figure 7, with deployments currently focused on the neighborhoods of Ewa Beach, Kapolei, Mililani, Wahiawa, Waipahu, Waipio, Pearl City, Aiea, Kaka’ako, and East Honolulu.

With the successful onboarding of temporary employees to augment the existing full-time and contract workforce, Oahu’s monthly AMI installs reached a peak of 13,000 meters in August 2022. However, meter supply chain issues forced the Companies to pause contractor residential AMI installs at the beginning of October, while temporary employees continued, resulting in reduced install averages of less than 9,000 meters a month. Contractors were slowly onboarded again in December for residential AMI installs and will ramp up in 2023 as confidence increases in the meter supply chain. The Companies are also exploring opportunities to accelerate commercial AMI installs, which are more complex than residential AMI installs.

The Oahu RF mesh network deployed to date is working as expected and service level agreement verification of pilot and proportional deployment network performance will begin in Q1 2023. Since the last Report, the Companies completed a full deployment RF mesh network desktop design and field surveys of proposed network equipment locations, as well as accelerated FAN equipment (i.e., gateways and routers) deployment to support the aggressive deployment of advanced meters. The Companies are also exploring opportunities with other public agencies/utilities to leverage some of their facilities and assets to deploy FAN equipment. The Companies continue to anticipate that the Oahu network deployment will finish in the first half of 2023. Consistent with prior plans, the Companies are prioritizing the use of RF mesh networks where deployment meter density warrants it. Other technologies such as cellular meters are only considered in lower density areas where mesh is not as appropriate.

The Companies provide below key Oahu installed meter, installed telecom and opt-out information for the Commission's review.

Program to Date (As of December 16, 2022)				
Gateways Installed	Routers Installed	Customer Outreach ¹⁰	Customer Opt-Outs ¹¹	Meters Installed (RF Mesh/Cellular/PLX)
63	68	266,659	3,786	109,127 (108,689/438/0)

Table 2 – Oahu Meters and Units of Telecom Installed

¹⁰ Cumulative unique customer accounts who received at least the initial 60+ day letter or email about their upcoming meter exchange since D&O 37655.

¹¹ Cumulative AMI opt-outs received since the beginning of the Smart Grid Foundation Project.

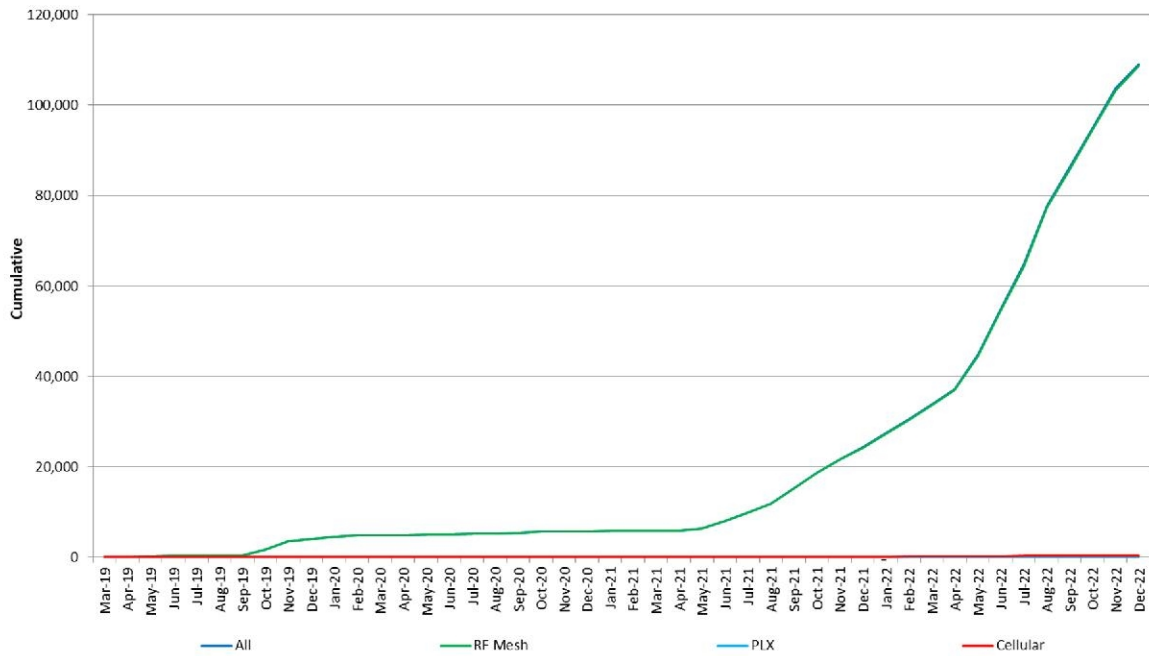


Figure 4 – Oahu Meters Installed (Cumulative)¹²

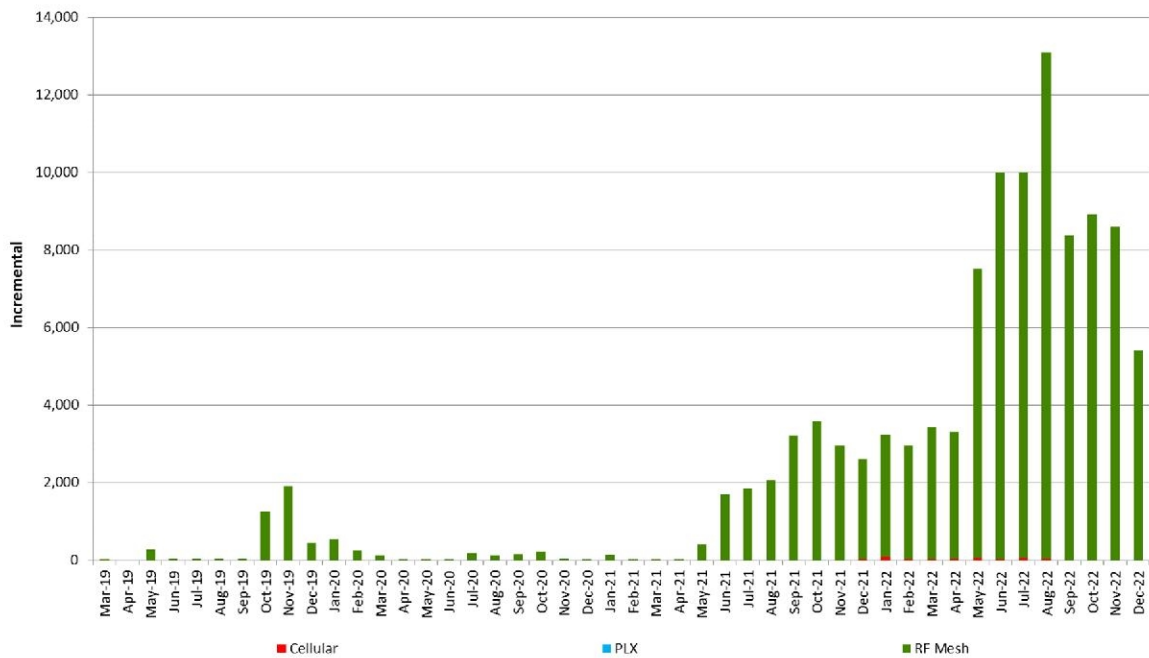


Figure 5 – Oahu Meters Installed (Incremental)¹³

¹² As of December 16, 2022.

¹³ As of December 16, 2022.

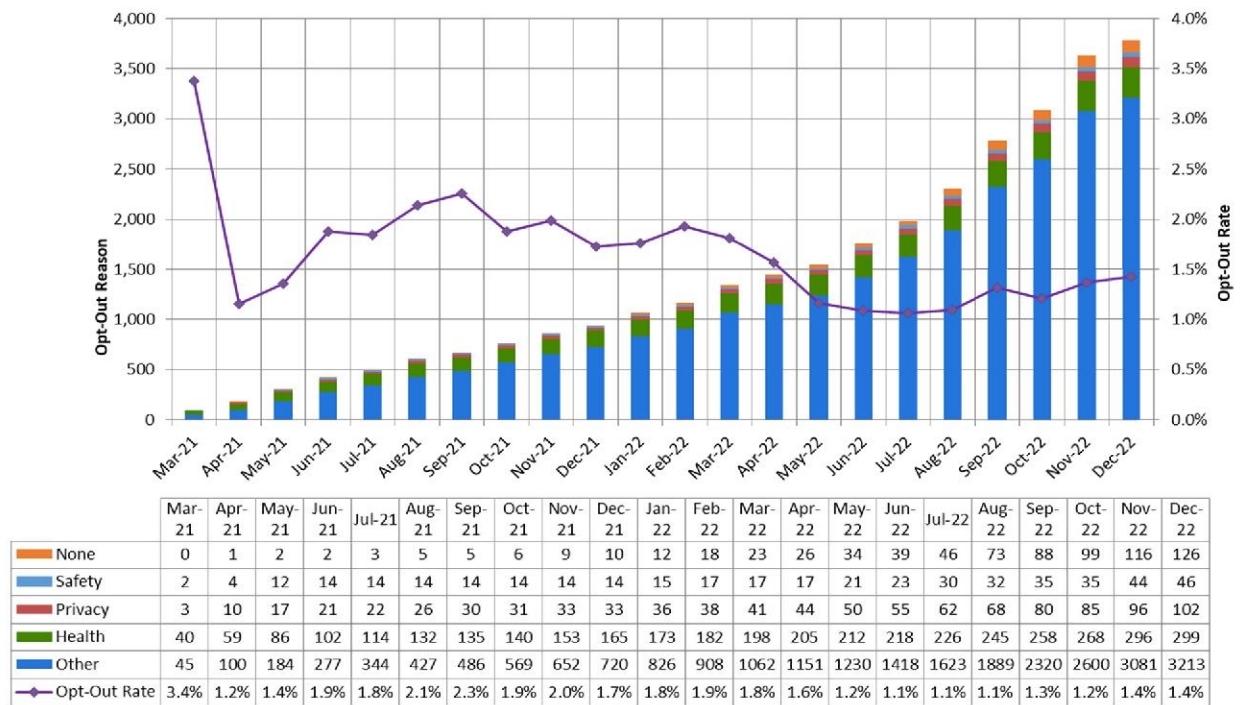


Figure 6 – Oahu AMI Opt-Out (Cumulative)¹⁴¹⁵

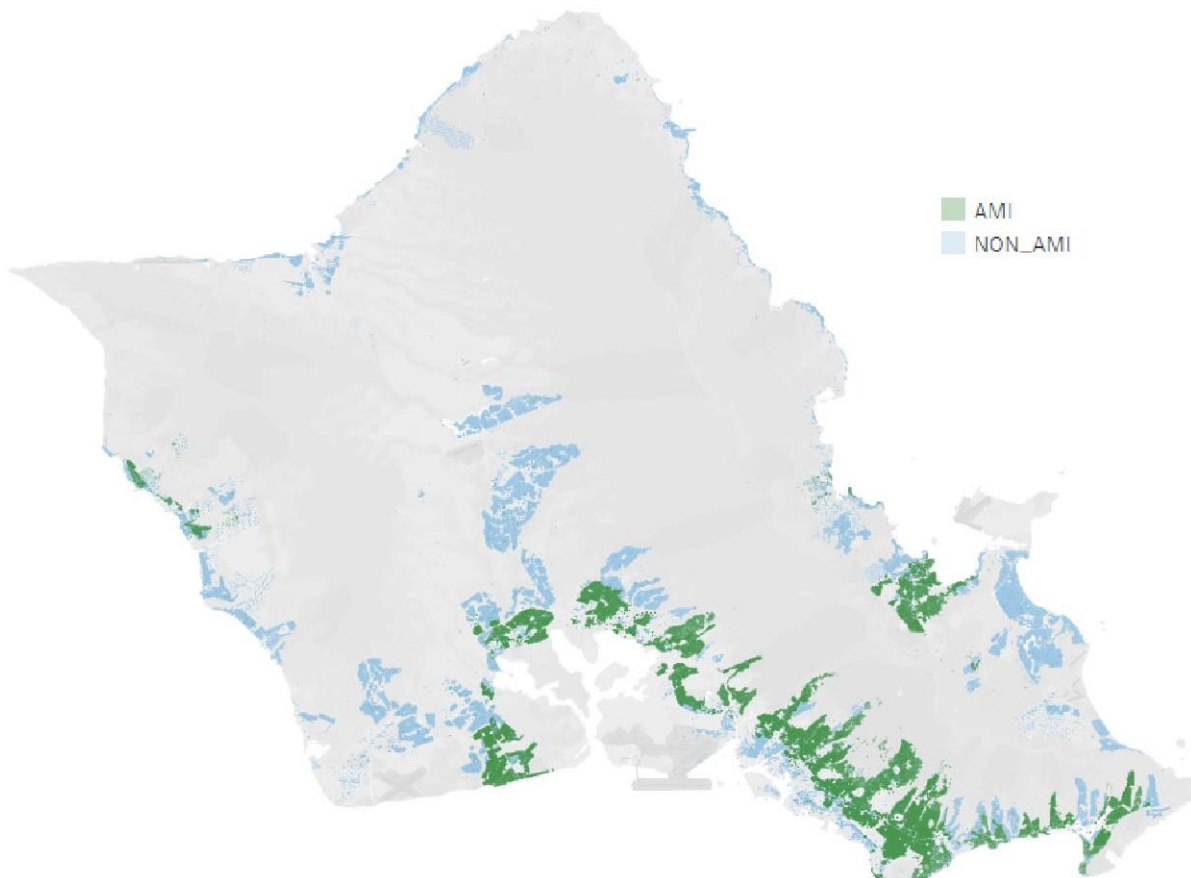


Figure 7 – Map of Oahu AMI Meters Installed

2. Hawai'i Island

The Companies have deployed advanced meters to about 44% of Hawai'i Island customers and are on-track to meet the Q3 2024 target of deploying AMI to all 88,000 Hawai'i Island customers, less opt-outs. About 3.1% of notified Hawai'i Island customers have elected to opt-out so far. A map showing the AMI and non-AMI customers on Hawai'i Island is provided further below in Figure 11, with deployments currently focused on the neighborhoods of Kailua-Kona, Waimea, Waikoloa, and Mountain View.

With the successful onboarding of temporary employees to augment the existing full-time and contract workforce, Hawai'i Island's monthly AMI installs reached a peak of more than 4,500 meters in September 2022. However, meter supply chain issues forced the Companies to pause contractor residential AMI installs at the beginning of October, while temporary employees continued, resulting in reduced install averages of about 3,000 meters a month. Due to meter supply chain issues for Hawai'i Island, contractors remain indefinitely paused for residential AMI installs. Separately, the Companies are exploring opportunities to accelerate commercial AMI installs, which are more complex than residential AMI installs.

The Hawai'i Island RF mesh network and power liner carrier technology (i.e., Gridstream PLX) deployed to date are working as expected and service level agreement verification of proportional deployment network performance will begin in Q1 2023. Since the last Report, the Companies completed a full deployment RF mesh network desktop design and field surveys of proposed network equipment locations, as well as accelerated FAN equipment (i.e., gateways and routers) deployment to support the aggressive deployment of advanced meters. The Companies continue to anticipate that the Hawai'i Island network deployment will finish in the first half of 2023. Consistent with prior plans, the Companies are prioritizing the use of RF mesh networks where deployment meter density warrants it. Other technologies such as cellular meters are only considered in lower density areas where mesh is not as appropriate.

The Companies provide below key Hawai'i Island installed meter, installed telecom and opt-out information for the Commission's review.

Program to Date (As of December 16, 2022)				
Gateways Installed	Routers Installed	Customer Outreach ¹⁶	Customer Opt-Outs	Meters Installed (RF Mesh/Cellular/PLX)
27	73	88,035	2,707	40,212 (38,559/358/1,295)

Table 3 – Hawai'i Island Meters and Units of Telecom Installed (Cumulative)

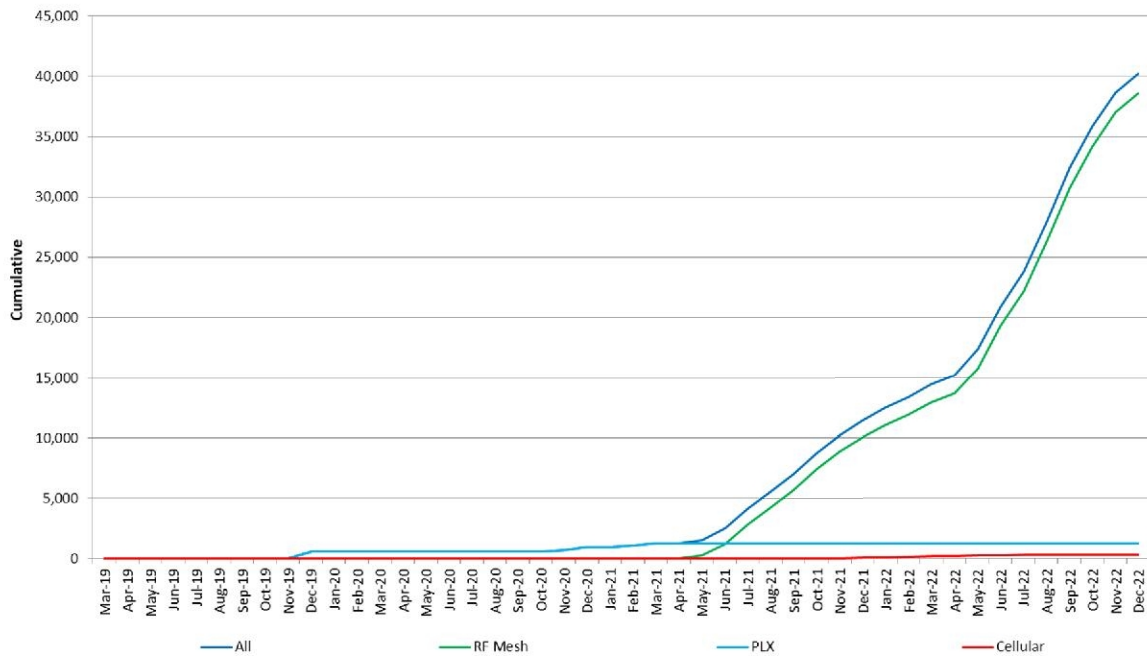


Figure 8 – Hawai'i Island Meters Installed (Cumulative)¹⁷

¹⁶ Cumulative unique customer accounts who received at least the initial 60+ day letter or email about their upcoming meter exchange since D&O 37655.

¹⁷ As of December 16, 2022.

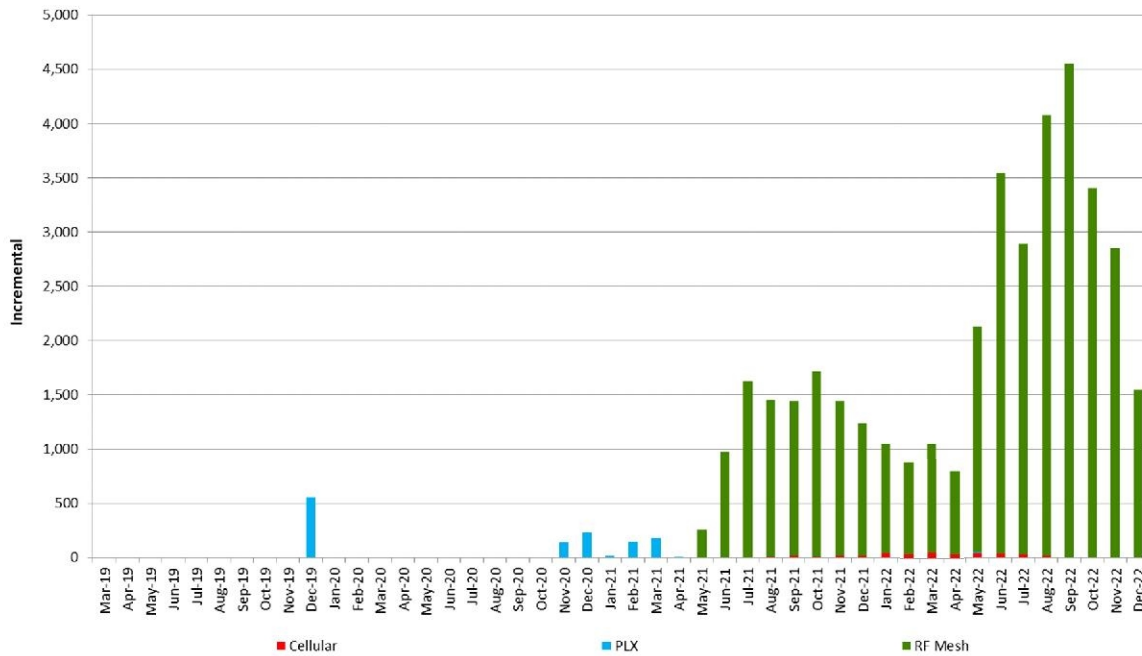


Figure 9 – Hawai'i Island Meters Installed (Incremental)¹⁸



Figure 10 – Hawai'i Island AMI Opt-Out (Cumulative)^{19,20}

¹⁸ As of December 16, 2022.

¹⁹ The AMI opt-out metric represents total opt-outs since program inception divided by the number of unique customer accounts who received their 60-day notification since Commission approval of proportional deployment.

²⁰ As of December 16, 2022.

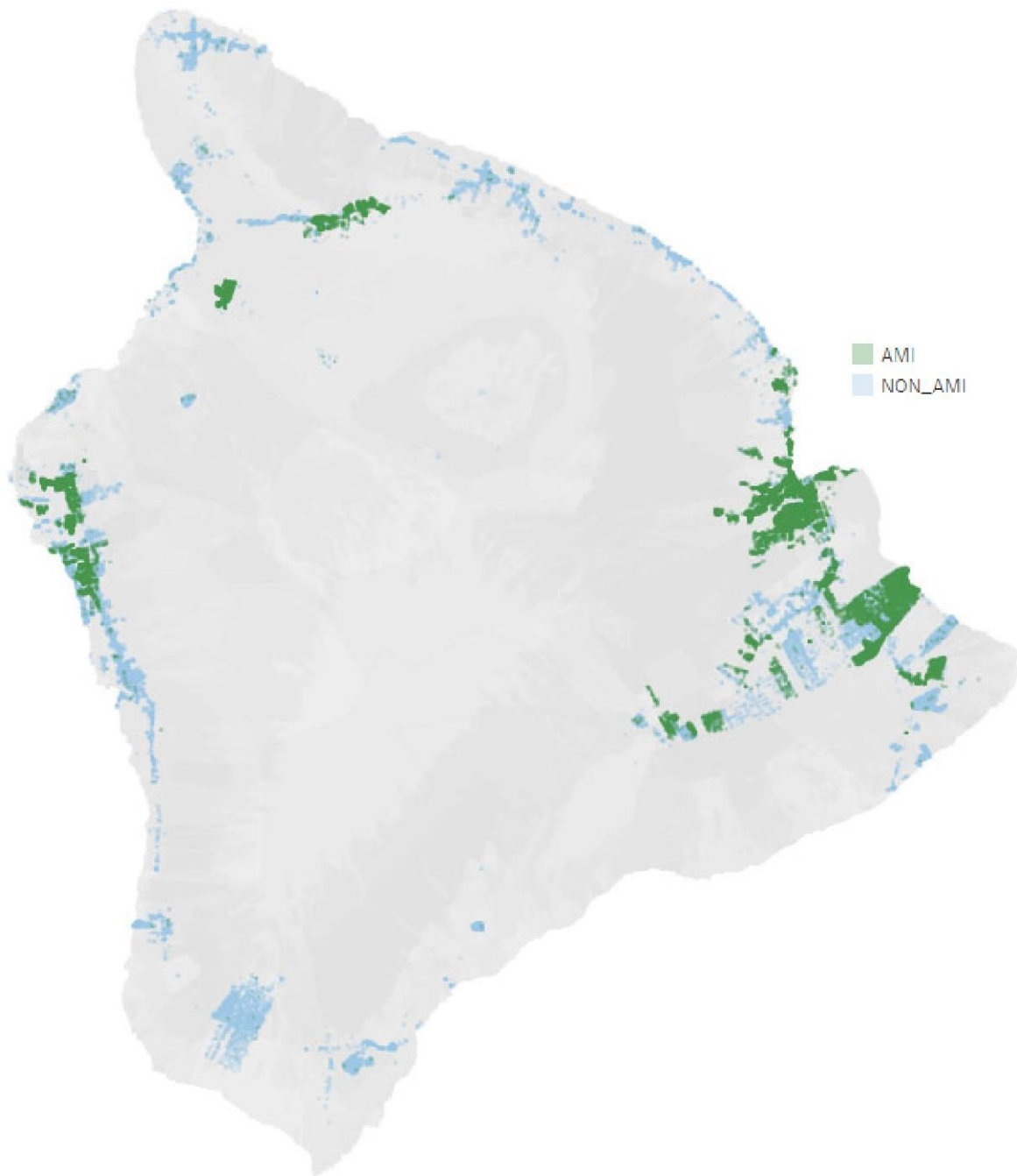


Figure 11 – Map of Hawai'i Island AMI Meters Installed

3. Maui County

The Companies have deployed advanced meters to about 53% of all Maui County customers and are on-track to meet the Q3 2024 target of deploying AMI to all 74,000 Maui County customers, less opt-outs. About 2.8% of notified Maui County customers have elected

to opt-out so far. A map showing the AMI and non-AMI customers on Maui County is provided further below in Figure 15, with deployments currently focused on the neighborhoods of Kapalua, Kula, Lanai, Wailea, and Haiku.

With the successful onboarding of temporary employees to augment the existing full-time and contract workforce, Maui County’s monthly AMI installs reached a peak of about 3,400 meters in August 2022. However, meter supply chain issues forced the Companies to pause contractor residential AMI installs at the beginning of October, while temporary employees continued, resulting in reduced install averages of about 2,500 meters a month. Due to meter supply chain issues for Maui County, contractors remain indefinitely paused for residential AMI installs.

The Maui County RF mesh network and power liner carrier technology (i.e., Gridstream PLX) deployed to date are working as expected and service level agreement verification of proportional deployment network performance will begin in Q1 2023. Since the last Report, the Companies completed a full deployment RF mesh network desktop design and field surveys of proposed network equipment locations, as well as accelerated FAN equipment (i.e., gateways and routers) deployment to support the aggressive deployment of advanced meters. The Companies continue to anticipate that the Maui County network deployment will finish in the first half of 2023. Consistent with prior plans, the Companies are prioritizing the use of RF mesh networks where deployment meter density warrants it. Other technologies such as cellular meters are only considered in lower density areas where mesh is not as appropriate.

The Companies provide below key Maui County installed meter, installed telecom and opt-out information for the Commission’s review.

Program to Date (As of December 16, 2022)				
Gateways Installed	Routers Installed	Customer Outreach ²¹	Customer Opt-Outs	Meters Installed (RF Mesh/Cellular/PLX)
29	24	67,871	1,875	39,359 (39,055/2/302)

Table 4 – Maui County Meters and Units of Telecom Installed

²¹ Cumulative unique customer accounts who received at least the initial 60+ day letter or email about their upcoming meter exchange since D&O 37655.

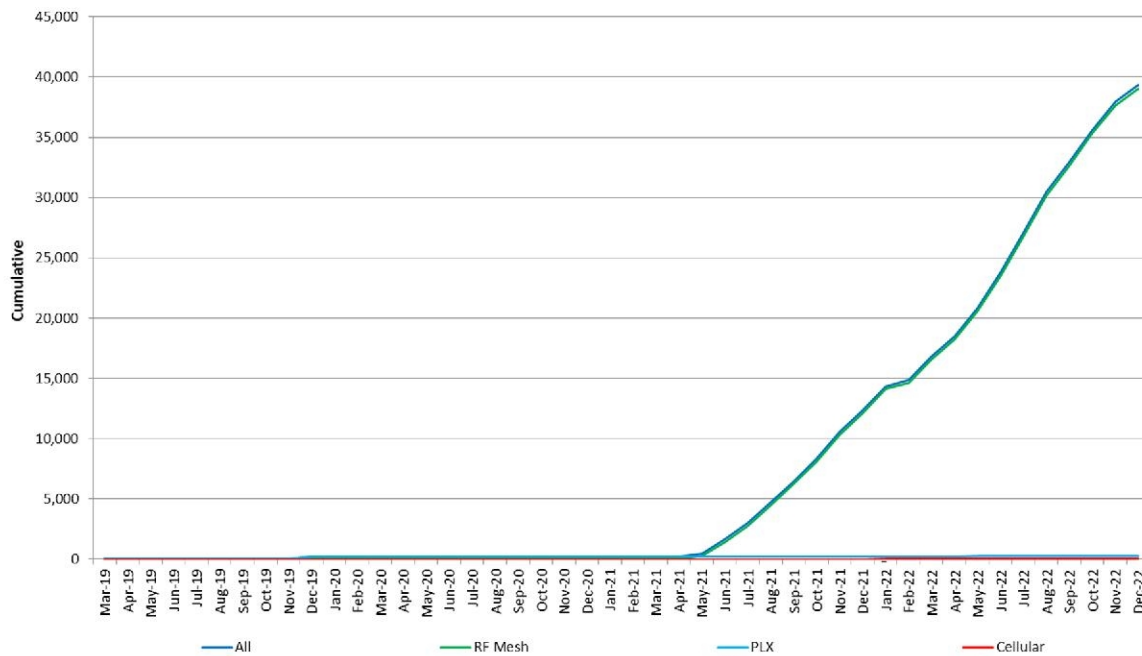


Figure 12 – Maui County Meters Installed (Cumulative)²²

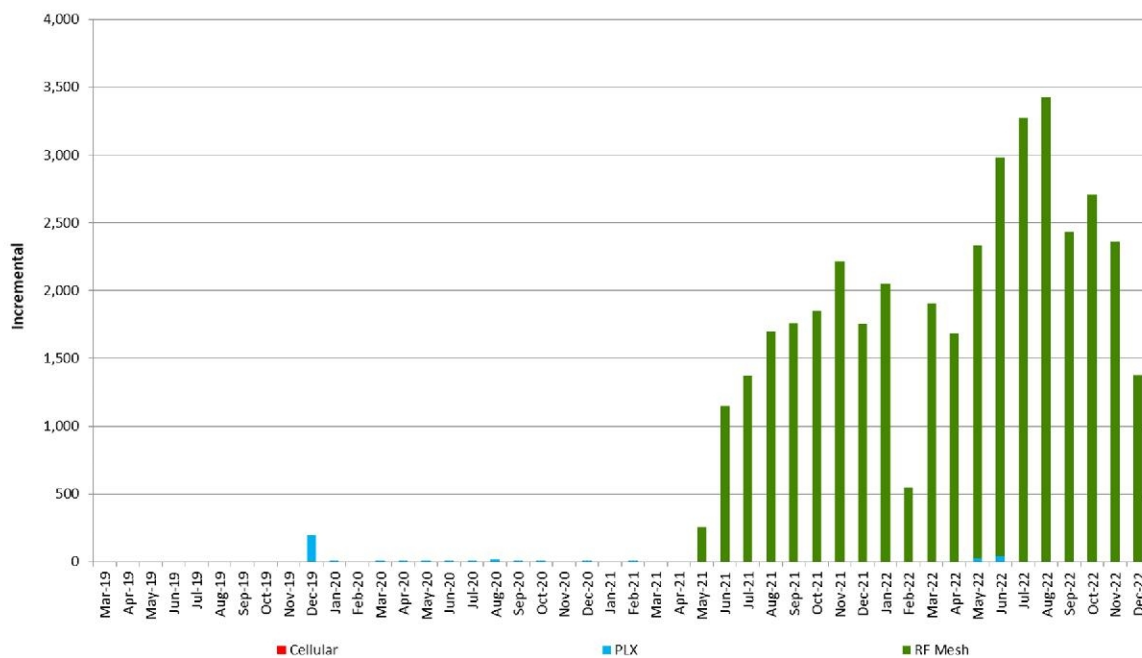


Figure 13 – Maui County Meters Installed (Incremental)²³

²² As of December 16, 2022.

²³ As of December 16, 2022.

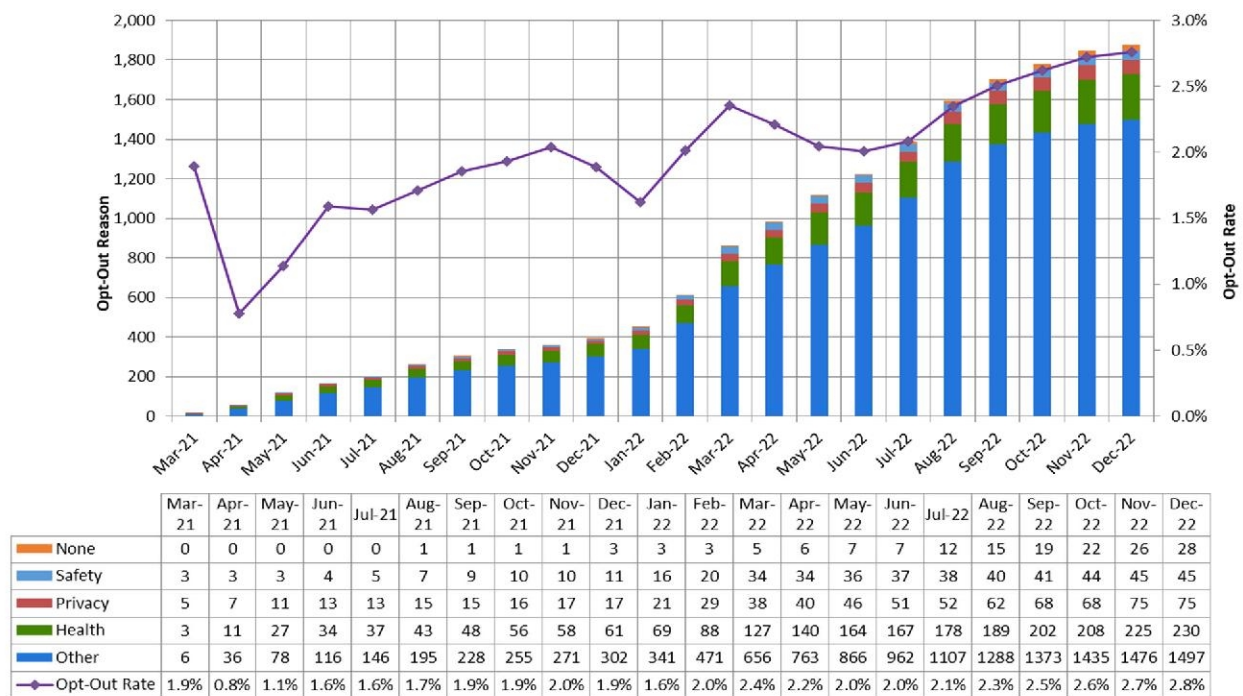


Figure 14 – Maui County AMI Opt-Out (Cumulative)²⁴²⁵

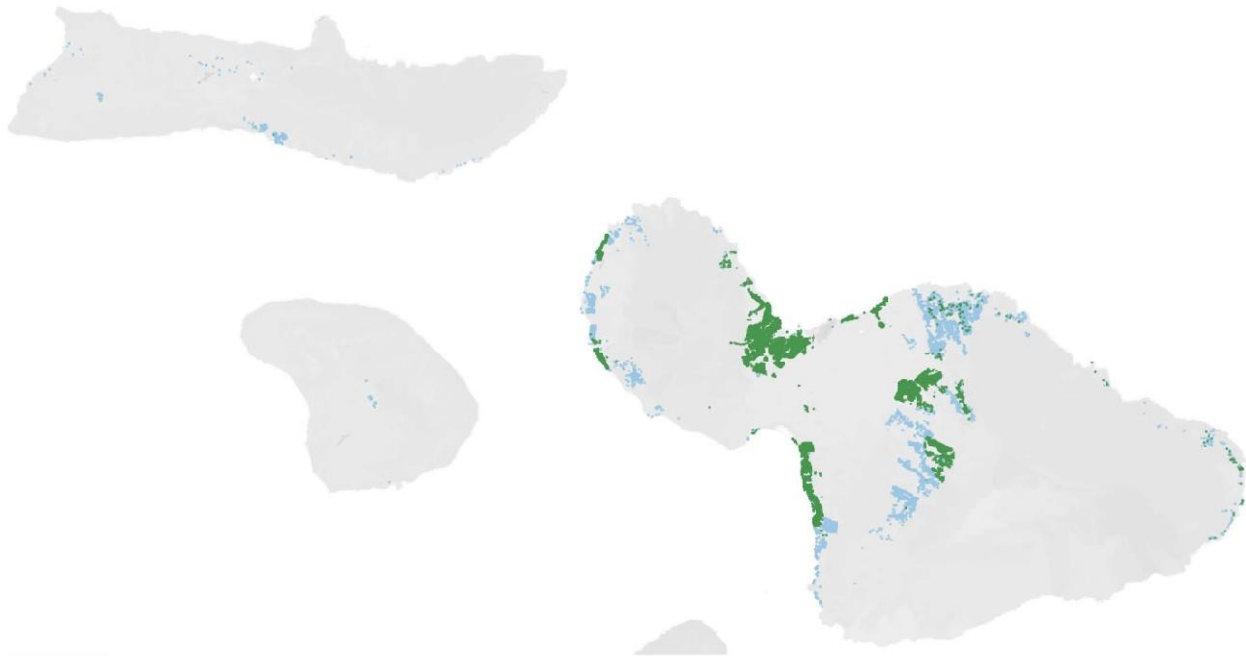


Figure 15 – Map of Maui County AMI Meters Installed

²⁴ The AMI opt-out metric represents total opt-outs since program inception divided by the number of unique customer accounts who received their 60-day notification since Commission approval of proportional deployment.

²⁵ As of December 16, 2022.

B. Customer Systems

Post-implementation activities for the Customer Systems project (Meter Data Management System “MDMS” and Energy Portal) were successfully completed in July 2021 and the systems are providing the necessary functionality to support full deployment. In October 2022, the Companies upgraded MDMS from version 4.2 to 5.1 as planned to maintain vendor lifecycle support.

C. Telecommunications Head End

The AMI Headend successfully migrated on-schedule from hosted to on-premise in November 2020. The Companies continue to collaborate with L&G to test an interoperable ecosystem for the Telecommunications Head End, as well as explore other options to support field devices.

III. ACTUAL CAPITAL AND DEFERRED COSTS INCURRED

The Companies have incurred the costs detailed in Table 5 below, reflecting actuals through November 2022. Note that the meter and telecom costs include materials purchased but not yet installed. The Companies are currently within the aggregate per-unit cost recovery caps for advanced meters and network and remain committed to identifying and implementing continuous improvement opportunities to remain within the aggregate cost recovery caps for full deployment.

	Oahu	Maui County	Hawaii Island
Cost Incurred			
Advanced Meter	\$22,840,458	\$8,186,946	\$8,466,898
Network	\$3,032,333	\$1,491,388	\$2,220,556
Customer Systems - Capital	\$1,708,343		\$97,981
Total Capital	\$27,581,134	\$9,678,334	\$10,785,435
Customer Systems - Deferred	\$11,610,319	\$2,497,739	\$2,512,820
Total Spend (Total Capital + Deferred)	\$39,191,453	\$12,176,073	\$13,298,255
Cost Ratios			
Aggregated Cost Ratio (per AMI customer by island)	\$249.41	\$254.77	\$276.42
Aggregated Cost Ratio (per Hawaiian Electric AMI customer)	\$256.33		

Table 5 – Capital and Deferred Costs Incurred (as of November 30, 2022)

As approved by the Commission in D&O 38241, the Company has repaired damaged meter bases as they are encountered during AMI deployment, without billing individual customers. This is for both scenarios where damage to the customer metering equipment is identified by visual inspection prior to the meter exchange process beginning, as well as when the damage is discovered or incurred after removal of the existing meter. The O&M costs associated with repairs are excluded from the Companies request for recovery through the MPIR adjustment mechanism. While the Company currently funds these O&M repair costs under Annual Revenue Adjustment (“ARA”) recovery, the Company is currently tracking the meter base repair information as directed by the Commission.

Program to Date (As of December 16, 2022)²⁶				
Hazards Addressed	Total Cost	Average Labor Cost	Average Material Cost	Total Average Cost
431	\$236,936	\$594.23	\$101.33	\$695.56

Table 6 – Hazardous Customer Metering Equipment Repairs (Cumulative)

IV. FUTURE METER DEPLOYMENTS

The Companies will continue to aggressively implement the Commission approved Scenario B deployment plan of prioritized main service cities. When appropriate, the Companies adjust the day-to-day deployment schedule to ensure operational efficiency to work around billing blackout periods (i.e., days each month when customer bills are prepared and SAP meter info must remain static), maintain contiguous deployment to build out the RF mesh, resource availability, and accommodate other important considerations. The Companies will also take into consideration the potential impact of D&O 38680,²⁷ which established an ARD Implementation framework, on the current AMI deployment plans. While the Companies anticipate falling just short of 200,000 AMI customers across the service territory by the end of this year (i.e., 2022), the Companies remain on-track to deliver AMI to 360,000 customers by the end of 2023 and finish full deployment by the end of Q3 2024, excluding customer opt-outs.

Installs of FAN equipment remain ongoing from now through the first half of 2023. Based on field surveys and real-life network performance results, network design optimization adjustments are being incorporated, as appropriate.

²⁶ Cost data accuracy is impacted by invoices yet to be received and ongoing efforts to obtain from electricians a breakout of labor and material costs (many invoices aggregate the costs under one line item).

²⁷ Docket No. 2019-0323

V. SUPPLY CHAIN RISKS

Despite best efforts to mitigate supply chain risks, including timely issuance of full deployment purchase orders by the Companies, L+G’s “all hands-on deck” approach described in the last Report and below, and incessant supply chain coordination between the Companies and L+G, meter supply shortfalls have been unavoidable. While the Companies’ employees continue to install residential AMI meters, these meter material shortages necessitated pausing contractor residential AMI installs until the Companies have higher confidence in the stability of the L+G supply chain.

The primary supply chain constraint continues to be raw material and component shortages from supplier decommits that feed into L+G's manufacturing. To mitigate this, the Companies consulted with L+G and made the decision to change residential advanced meter models from the current AXe model to a newer AXei model, as the raw materials and components for each model come from different suppliers. There is no functional difference between the AXe and AXei residential meters, but the AXei meter does utilize a different baseplate that is compliant with the latest ANSI standards and possesses more Load Profile memory.

The Companies continue to work with L+G to test and validate the new AXei meters before residential installers begin deploying them in January 2023 across the service territory.

Concurrently, L+G continues to apply the following “all hands-on deck” approach to mitigate further supply chain issues:

- [illegible]

The Companies will continue to coordinate with L+G to mitigate supply chain risks to the best extent possible. If any unmitigable supply chain risks materialize, the Companies will notify the Commission about potential impacts to the full deployment plan, schedule, and costs.

VI. COLLABORATIVE DATA SHARING EFFORTS UPDATE

Since the last status report, the Companies continue to provide Hawaii Energy access to the latest advanced meter data under the same data sharing terms as used for traditional meters, as well as an aggregated and anonymized version of the latest energy usage data set to the required public entities. In response to feedback from some public entities that the prior file format sizes were too large for processing with their existing systems and software, the Companies now provide the aggregated and anonymized data in both comma-separated values (".csv") and in an alternative file format known as Apache Parquet, which are 10x smaller than .csv. With Commission approval of the Companies' Data Clearinghouse innovation pilot, the Companies look forward to implementing the Data Analytics Clearinghouse that will make the data sharing process with public entities easier and more productive.

VII. GMS PHASE 1 BENEFITS

As mentioned earlier, the Companies believe accurate reporting of quantifiable benefits for Grid Mod Phase 1 is not attainable until the 2024 Annual MPIR/EPRM True-up filing. By this time, the net benefits of AMI will be clearer as the Companies will have deployed AMI to more than 75% of the service territory. It is currently very difficult to accurately isolate net AMI benefits on utility operations due to the fact AMI deployment is not even halfway finished, and many of the resources that may benefit from AMI enabled efficiencies in the future are currently juggling the operations and maintenance of both AMI and non-AMI systems and business processes. These resources are also involved with AMI deployment, which means they are currently expending time on temporary tasks that will conclude once AMI deployment is finished. For example, in reviewing Field Services work notifications since 2019, net Field Services labor hours have increased as labor hours for AMI activities have outpaced reductions in labor hours for manual Field Services activities.

However, the Companies wish to reiterate to the Commission its commitment to developing a methodology to track project benefits and ensuring the full extent of utility AMI benefits are sufficiently investigated. The Companies understand this is critical to identifying and quantifying *net reductions in utility operating costs* due to Grid Mod Phase 1 and ensuring that interim recovery through the MPIR mechanism is appropriately offset by these quantifiable benefits realized by the Companies in the interim period. The Companies share below the potential benefits that are being considered as part of the GMS Phase 1 benefits tracking and reporting effort. The Companies believe it is important to note that both quantitative and

qualitative benefits must be considered when evaluating the merits and prudence of Phase 1's implementation.

The Companies believe GMS Phase 1 benefits can be organized under three primary benefits categories:

- 1) **Reliability:** faster identification of power outages for customers so that the Companies can respond and restore power sooner, as well as enhance Operations and Planning functions so more Distributed Energy Resources ("DERs") can be reliably integrated onto the electric grid.
- 2) **Economic:** reducing utility operating costs which produces downstream cost savings for customers, as well as providing tools and programs for customers that enable them to reduce their energy use.
- 3) **Customer Satisfaction:** improve customer satisfaction by leveraging technology to improve the digital customer experience and offer customers more options, as well as reducing greenhouse gas emissions to improve customer quality of life.

Below the Companies take a deeper dive into each of the categories and the specific benefits that the Companies are evaluating the feasibility to track and report on, either qualitatively or quantitatively:

- 1) **Reliability**
 - a. Upon implementation of the Grid Mod Phase 2 Advanced Distribution Management System ("ADMS") and integration of AMI with the Outage Management System ("OMS"), the Companies will be able to automatically identify when customers experience power outages, which will enhance situational awareness for operators and allow the Companies to respond and restore power sooner and thus improve Customer Average Interruption Duration Index ("CAIDI") performance.
 - b. AMI enables improved forecasting and grid planning so that the Companies can reliably integrate more DERs onto the electric grid.
 - c. AMI integrated with the ADMS provides system operators with enhanced capabilities to reliably dispatch and control DERs when AMI is installed in the production meter socket.
- 2) **Economic**
 - a. **Utility Operations**
 - i. Reduced Field Services operating costs because of AMI enabled remote connects/disconnects, reduced manual re-reading requests, etc.
 1. The Companies also recognize there will be new incremental Field Services operating costs associated with AMI

monitoring, increased false positive tamper detection checks until the algorithms are fine-tuned, etc.

- ii. Reduced meter reading operating costs because of AMI will automate many manual meter reading functions.
 - iii. Reduced vehicle fleet operations and maintenance costs due to the need for fewer truck rolls for meter reading, manual service connects/disconnects, etc. because of AMI.
 - iv. AMI deployment-related capital and O&M cost savings enabled by aggressive project management.
- b. Customer Programs and Tools
- i. Greater transparency for AMI customers about their energy use from the Energy Portal and energy usage alerts, enabling customers to make informed decisions about energy conservation.
 - ii. Financial incentives for customers from participating in time-of-use ("TOU"), DER, and DR programs enabled by AMI.

3) Customer Satisfaction

a. Customer Experience

- i. Customer Care Representatives can better serve AMI customers because they have access to the Energy Portal.
- ii. Tailored Energy Portal features for specific AMI customer segments (residential versus commercial).
- iii. AMI eliminates the inconvenience of manual meter reads for customers.
- iv. AMI reduces the need for estimated bills and disputes involving estimated bills.
- v. AMI reduces the need to reprocess customer bills due to incorrect data entry.
- vi. Faster service activation or transfer by leveraging AMI remote meter service switch.
- vii. AMI enables new and advanced rate programs to offer customer's more options.
- viii. AMI-enabled Green Button access will enable customers to download their detailed energy use data or automate the data sharing process with third party energy services providers so that customers receive more tailored energy solutions.
- ix. AMI enables identification of rogue/illegal distributed generation and allows the Companies to partner with customers to get them enrolled into an eligible DER program.

b. Environmental

- i. Greenhouse gas reductions from reduced truck rolls and gas savings because of AMI.
- ii. Greenhouse gas reductions from increased integration of renewable energy from AMI-enabled DER and DR programs.

VIII. NEXT STEPS

The Companies will continue to diligently implement full deployment of AMI under Phase 1 of the Grid Modernization Strategy, as approved. In addition, the Companies will continue to pursue continuous improvement opportunities to further accelerate advanced meter deployment. Lastly, the Companies will continue its efforts to develop a methodology for calculating and tracking Grid Mod Phase 1's quantifiable benefits and plan to report during the 2024 Annual MPIR/EPRM True-up filing.

Pursuant to Protective Order No. 35591, filed on July 18, 2018, in this proceeding, this log (1) identifies, in reasonable detail, the information's source, character, and location; (2) states clearly the basis for the claim of confidentiality; and (3) describes, with particularity, the cognizable harm to the producing party or participant from any misuse or unpermitted disclosure of the information.

Reference	Identification of Item	Basis of Confidentiality	Harm
Status Report Section V Supply Chain Risks	Supply chain risk information.	Confidential commercial, financial and pricing information which falls under the frustration of legitimate government function exception of the Uniform Information Practices Act ("UIPA"). ¹	Public disclosure of the confidential information could place the Company at a competitive disadvantage in future contract negotiations; impact the Company's bargaining power relative to its vendors; harm the Company's relationships with existing and/or prospective vendors and customers; discourage vendors from doing business with the Company and making confidential disclosures to the Company in the future; and infringe upon certain privacy and/or proprietary rights of the Company/employees/vendor.

¹ Haw. Rev. Stat. § 92F-13(3).

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